

Standard Operating Procedure for Investigation of Human Cases of Avian Influenza

A disease outbreak has been defined as a short-term epidemic or a series of disease events clustered in time and space. The disease events are usually new cases of disease usually occurring at a higher frequency than that normally expected.

An outbreak investigation is a systematic procedure to help identify causes and sources of epidemic with a view to control of an existing epidemic and prevention of possible future ones.

I. **Purpose:** To investigate the outbreak of H5N1 depending upon the trigger points

Investigation of human cases of AI (H5N1) is essential to achieve the following objectives:

- Confirm the diagnosis of probable or suspect case of H5N1.
- Investigate the source of infection of confirmed case of H5N1
- Document the details of the patients clinical features and clinical history
- Trace the contacts of the case patients
- Initiate preventive measures to prevent further spread.
- Reduce morbidity and mortality by early diagnosis and treatment
- Determine if there is increased evidence of human to human transmission.
- **Ensure timely exchange of information among different stake holders for informed decision making.**

II. **Scope:**

This document describes the general principles and procedure for investigation and confirmation of suspected and probable human AI cases in the field

III. **User**

The document will be used by the Investigation Team and Surveillance Team of Rapid Response Teams when there is evidence of trigger points for investigation.

IV. **Users or targets**

- Medical Officials and para-med
- District Health Officials
- Public Health Officials
- Laboratory Personnel
- Rapid Response Teams (Investigation Team)

V. **Manpower/Team composition**

- Epidemiologist (Team Leader)
- Medical Specialist/Medical Officer
- Concerned Program Personnel
- Laboratory Personnel

- ACOs and Health Assistant

VI. Materials and equipment

Items	Units	Quantity
Personal Protective Equipment (PPE)		
Disposable Glove	pairs	50
N95 Masks	sets	10
Disposable Overalls	sets	10
Shoe cover	pairs	10
Goggles	pairs	10
Rubber Band	box	1
Documents		
Outbreak Investigation Forms	Number	10
Laboratory Sample Submission Form	Number	10
Written Instructions/SOP Print-outs	Number	4
Notebooks & pen	Number	5
Locality Map if available	Number	1
Laboratory consumables		
Soap	number	2
Alcohol Swabs pad	number	50
Cotton Roll	rolls	3
Syringes, 5ml	Number	30
Needles, 21 gauge	number	30
Cold Box	number	2
Rapid Antigen Detection diagnostic kits	set	5
Eppendorf Tubes	number	30
Waterproof Markers	number	3
Ice Packs	number	10
Leak proof plastic bags	number	20
Leak proof autoclavable plastic bags		
Swabs	number	50
Virus Transport Medium	number	20
Tissue paper	rolls	5
Sterile petri dish	number	10
Disinfectant - 5 litres jar	number	3
Others		
Antiviral drug (Tamiflu)		
Fund		
Bottled Drinking Water		
Meals and refreshment		
<u>Extension</u> gears –tent, boots, sleeping bag, mat, rain coat		

VII. Trigger points for Investigation

A) Normal situation:

- *Routine ARI surveillance detects ARI-like illness with an unusual distribution by age group, or unexplained acute respiratory illness in previously healthy adults or adolescents.*
- *Two or more persons presenting with manifestations of unexplained acute lower respiratory illness with fever (>38oC) at health facility.*

B) If confirmed or suspected AI outbreak in birds or animals

- *Any ARI cases presenting from the area and those epidemiologically linked.*

C) Laboratory-confirmed human AI case

VIII. Key steps for investigation of human cases of A (H5N1)

1. Prepare for the investigation

RRT should gather preliminary background information and assemble the necessary materials and supplies before proceeding to the field:

Pre-investigation preparation

- ❖ **Formation of team members:** All members of the investigation team should be gathered.
- ❖ **Planning of response among team members:** The team members should discuss and plan the response
- ❖ **Discuss the roles and responsibilities of each member:** Each member of the team should be briefed about their roles and responsibilities
- ❖ **Arrangement of logistics:** All required logistics should be arranged with the help of the check lists. (As per equipment list)
- ❖ **Arrange for adequate number of forms**
- ❖ **Background Information:**
 1. Location of the outbreak : Dzongkhag, Geog, village (Logistica)
 2. Date and time of outbreak
 3. Date and time of report of the outbreak
 4. Trigger points for investigation
 5. Population distribution
 6. Local Health and other facility

7. Address and contact details of local health personnel: Name of the health personnel, address and phone numbers etc.
8. Communication facility: Road accessibility, telephone, fax and internet facilities

Provide information to the local health authority about the teams visit to the outbreak area

2. Field investigation:

I. Meet the local health authority and get the following details:

- ❖ Reconfirm the background information
- ❖ Number of cases if possible
- ❖ Other clinical and epidemiological details
- ❖ Any other relevant information
- ❖ Trigger points for investigation

Note: Visit the outbreak area depending upon the trigger point for investigation.

II. The investigation team should carryout the following activities after reaching the outbreak area and record accordingly

1. Patient's Details
2. Clinical Data
3. Travel History.
4. Drug (Treatment History)
5. Laboratory Data:
6. Exposure History
7. Contact History
8. Contact tracing
9. Investigation of Deaths
10. Active case-finding
11. Provide report and recommendations on outbreak to the program:
12. **Initiate enhanced surveillance in coordination with Surveillance Team as per the SoP on surveillance**
13. Undertake animal health and environmental investigations
14. Assessment of possible human-to-human transmission
15. Analyze data
16. Declare buffer and containment zone
17. Initiate preventive measures

III. Visit the patient in the hospital or home and get the following details from the patient or family members using the **Disease Investigation Form** and **Contact Tracing Form.** (**Annexure I & II**)

1. **Patient's Details:** All the patient details should be noted so that patient can be followed up later on.
2. **Clinical Data:** Detail clinical data of the patient should be filled up
3. **Travel History:** Specify the country or place visited by the patient 7 days before the onset of symptoms.
4. **Drug (Treatment History):** Write in details whether anti-viral prophylaxis was given with dose and duration. Also enter the details of drugs taken/ taking by the case patient.
5. **Laboratory Data:** Use the **Laboratory Investigation Form** for Avian Influenza (**Annexure III**) to complete the details of laboratory investigation.

If other diagnostic investigations are performed like X-Ray, Ultrasound, ECG etc it should be noted in the case investigation form with date and findings.

Laboratory Samples if not already sent have to be collected from the following sources for confirmation of H5N1

- a. Case patient (as priority)
- b. Symptomatic contacts (as priority)
- c. Asymptomatic contacts or asymptomatic person who has been exposed to another source of AI infection.

Fill all the details in the laboratory form for sample collection. (***Refer** SOP for collection of samples for the type and the recommended number of specimens to be Collected, optimal timing of specimen collection, which varies for respiratory and blood Specimens, correct collection techniques, including the appropriate use of PPE, and standards for specimen storage, packaging and transport*)

Following details should be accompanied with the samples

- Patient details
- Date of sampling
- Type of test,
- Type of sample

(The specimen should be appropriately labeled with above details. Identification should be appropriate to distinguish multiple specimens obtained from the same patient.)

6. **Exposure History:** The exposure of the case patient to any animals/poultry before the onset of symptoms should be noted. If the patient has positive history of exposure to any poultry or/animal source, then separate note should be made as detailed below.

Inquire about history of exposure of case patient within 7 days of illness:

- Ill or dead poultry, wild birds, and contaminated environments. (*e.g. exposure to poultry droppings including fertilizers or contaminated sewage, bathing in ponds/canals where domestic or wild birds can be found, etc*)
- Poultry farm, visit of live/wet market, hunting
- De-feathering, slaughtering, butchering, preparing, cleaning of cages, handled/used droppings as fertilizers, handled/played with poultry)
- Occupational exposure to animal and/or animal products (e.g. slaughterer, farm Worker, factory worker, poultry seller, veterinarian, culler, laboratory worker)
- Consumption of raw or undercooked animal products (e.g. meat, eggs, blood, liver)
- H5N1 outbreak in animals in the area
- First/last date of contact

7. **Contact History:** The patient or his attendant should be interviewed to get information if the patient had come in contact with suspect or confirmed case of H5N1 before 7 days of the onset of symptoms. If there is positive history of contact then separate note should be made as detailed below.

- Relationship of the patient with the contact
- First and last date of contact
- Type of contact (Speaking, slept in same room, touched, provided bedside care, any other)

8. **Contact tracing:** Patient or his relatives should be interviewed about the name and details of people who had come in contact after the onset of illness with the case patient and all details to be entered in the contact tracing form.

Filling up the contact tracing form:

- **Case information:** Fill up the details of the case patient as detailed in the form.

Surveillance of contacts:

- **Confirm the family/household composition and identify contacts of the case patient and list them in the contact tracing forms.**
- **Proceed to interview and examine the contact and complete the contract tracing form**

Make a separate note of the following observations:

- Inquire about illness or deaths in birds, cats, swine, or other animals in the household and neighboring area.
- Enquire if they have domestic poultry and whether poultry and other animals were allowed to enter the house, had access to household water and food storage areas.

Actively search for cases and their contacts

The case definition will be as per clinical management guide lines.

Contact tracing should be done for persons who had close unprotected (i.e., were not wearing PPE) contact with the case patient between 1-14 days after the case patient's onset of illness.

If the number of contacts is many then contact tracing should be prioritized for the following type of cases.

- Probability of AI (H5N1) infection in the case patient (e.g. contacts of confirmed or probable cases);
- Duration, spatial proximity, and intensity of exposure to the case patient (e.g. health-care workers, household contacts sharing the same sleeping or eating space, persons providing bedside care);
- Likelihood that human-to-human transmission has resulted from contact with the case patient.

A line-listing of all contacts and co-exposed persons should be maintained as below:

- Demographic information,
- Date of last common exposure or date of contact with the case patient,
- Daily temperature check,
- Date of onset of fever or respiratory symptoms ,
- Antiviral prophylaxis

For symptomatic contacts

- Identify symptomatic contacts for isolation
- Collect laboratory specimen and send for testing

9. **Investigation of Deaths:** If deaths have been reported from the area before the arrival of the investigation team then proper verification should be done based on epidemiological and clinical data to confirm whether the cause of death is from AI.

Use of PPE during investigation: The use of PPE by investigators during home visits will depend upon the nature of the risk of exposure. (Refer PPE guide line) Investigators may elect to interview persons outdoors and not in a closed interior setting, avoid direct face-to-face contact.

10. **Active case-finding:** Active case finding should be carried out in the area by house to house visit and should focus on:

- Persons who have exposure to birds and animals
- Persons with unexplained acute lower respiratory infection with fever or persons who died of an unexplained respiratory illness with fever

Visit hospitals and other sites of health care facility

All locations where the patient received traditional or non-traditional care should be visited.

Visits should be undertaken regardless of whether the patient has died or been discharged in order to:

- Obtain information about the case patient from treating physicians, hospital registers and records about clinical course, treatment, epidemiological/exposure information;
- Obtain additional specimens from the patient for testing if needed; identify and secure any stored specimens previously collected from the patient.
- Review all records and registers for possible cases of acute febrile respiratory illness both prospectively and retrospectively.
- Identify any health-care workers, patients, or others who were close contacts, especially those who may require chemoprophylaxis.
- Health care workers who have provided care for case patients should be monitored for fever and symptoms of influenza-like illness (cough, sore throat, difficulty in breathing), irrespective of the use of PPE

- Conduct site visits and review procedures in key areas of the facility including the Isolation area, triage area and laboratory facilities.

11. Provide report and recommendations on outbreak to the program or Incident Commander of the Incident Operation Center as appropriate:

1. Confirm if its an outbreak (See definition of outbreak)
2. Access if there is human to human transmission
3. Characterize the out break time, place and person
4. Confirm if its AI
5. Establish the extent of the outbreak
6. No. of cases and contacts
7. Provide recommendation on actions to be initiated

12. Initiate enhanced surveillance as per the SoP on surveillance in coordination with Surveillance Team

In addition to active case-finding and contact tracing as part of the investigation, efforts should be undertaken to enhance routine surveillance systems in the area(s) where case patients(s) reside or where animal outbreaks are occurring.

- Enhanced surveillance should consider the health-care seeking behavior of the population
- Active surveillance in hospitals particularly targeting in-patient and emergency departments.
- Active surveillance of cases in the community

13. Undertake animal health and environmental investigations

Public health investigators should work with animal health investigators to assess the role of AI (H5N1) infection in wild or domestic birds or other animals as sources of possible exposure for human cases.

14. Assessment of possible human-to-human transmission

Detection of two or more cases of confirmed, probable or suspect AI(H5N1) infection with onset of illness in the same two-week period and who are in the same geographical area and/or are epidemiologically linked, requires careful and detailed investigation to assess if transmission was likely due to a common source exposure or to human-to-human transmission.

In practice it can be very difficult to differentiate between human-to-human transmission and a common source exposure. Human-to-human transmission may be indicated in the setting of:

- Well documented exposure to a confirmed, probable, or suspect human case

And the time interval between contact with a human case and illness onset is 7 days or less **and** Absence of an alternative source of exposure such as exposures to birds, animals, feathers, droppings, fertilizers made of fresh bird droppings, contaminated environments, or laboratory specimens

OR

- Several generations of transmission linked to a primary case

15. Declaration of Containment and Buffer Zones (See the details on Rapid Containment protocol of AI outbreak)

- Create a geographically defined containment zone around the cases where widespread anti-viral and non-pharmaceutical interventions should be used.
- Create a Buffer Zone surrounding the Containment Zone where active and complete surveillance should be initiated to detect any possible cases of pandemic influenza.

16. Analyze data

All data should be analyzed in terms of person, place, and time, geographical location, family trees, demographic characteristics and clinical and epidemiological details.

17. Implement prevention and control measures

Many of the standard prevention and control measures to reduce opportunities for further Transmission of AI (H5N1) should be implemented as followed:

1. Strict infection control, the use of PPE during the delivery of care, and isolation of cases.
2. Administration of antiviral drugs for the treatment of cases and targeted prophylaxis of close contacts.
3. Initiation of active case-finding and enhanced surveillance.
4. Active monitoring of contacts for the development of fever and respiratory symptoms.
5. Voluntary home quarantine of asymptomatic case contacts if human-to-human transmission occurs

Annexure I

Outbreak Investigation Form

<i>Health Facility:</i>		<i>Date:</i>	
Patient Details			
<i>Name:</i>		<i>Age/Sex:</i>	
<i>Telephone number:</i>			
<i>Address:</i>		<i>Geog:</i>	<i>Dzongkhag:</i>
<i>Village:</i>			
<i>Occupation (Specify)</i>			
Clinical details			
<i>Date of reporting to the health worker/Health facility:</i>			
<i>Date of initial symptoms:</i>			
<i>Clinical features at the time of examination and duration:</i>			
<i>History of Present illness:</i>			
<i>History of Past illness:</i>			
Drug History: Antiviral Prophylaxis and others (Specify Name and duration)			
<i>Clinical findings:</i> Fever, Sore Throat, Cough, Generalized body ache, Head Ache, Fatigue, others (specify)			
Travel History:			
<i>History of Travel within the last 7 days:</i> Area and Location:			
Exposure History			
<i>History of exposure to animals and their environment within last 7 days before the onset of symptoms: If yes then make a separate note as per SOP</i>			
Laboratory: Use the laboratory investigation form for avian Influenza			
Other investigations: X-ray..... ECG..... USG.....Others			
<i>Test sent for investigation of Influenza A (Y/N)</i>		<i>Lab. Ref. No.....</i>	
Contact History			
<i>History of contact with confirmed or suspect human case of H5N1 within last 7 days: If yes make a separate note as per SOP:</i>			
Contact Tracing (Use separate Forms)			
<i>Name of the person contacted:</i>			
<i>Treatment Given:</i>			
<i>Isolated/ Quarantined:</i>			
<i>Outcome: Improve, (dead/alive)</i>			

Annexure: II

Contact Tracing and Follow Up Form

Case Information

Name of patient:

Age/Sex:

Date of Illness:

Date when case reported the illness:

Address:

Serial Number	Name	Age	Sex	Contact Type	Relation with case	Address	Date of first contact with case	S/F/N	Day 1	2	3	4	5	6	7	8	9	10
1																		
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		

Contact Type:

- A: Close Contact less than one meter
- B: Household contact but more than one meter
- C: Health Care Worker contact – protected

Status:

- S: Seen and healthy
- F: Influenza Like Illness, notify
- N: Not Seen

Annexure III:

Avian Influenza (H5N1)

Laboratory Investigation Form

Health facility:		Date:		
Name of Patient:		Age/Sex:	Occupation:	
Address:	Village:	Geog:	Dzongkha:	
Laboratory test result <i>(filled up or attached the copy of result if available)</i>				
TLC:		RFT:		
DLC:		LFT:		
Date of specimen collection:				
Specimen type (Tick)	Nasopharyngeal swab:	Throat swab:	Blood:	
Laboratory test request (circle/tick appropriate one))				
Date of specimen collection:				
CBC		LFT		RFT
IFA		RT-PCR		Virus isolation
Requested by:		Contact No.:		
LABORATORY USE ONLY				
Date of sample received:		Received by:		
Lab ID No.				